Electrochemical Hydrogen Peroxide Generator for Multiple Applications in Space, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

Controlled Ecological Life Support System (CELSS) facilities require the development of reliable systems for the disinfection of microorganisms. There are several disinfectants that have been used, or proposed for use in CELSS facilities, including hypochlorite, iodine, ozone, silver, and quaternary ammonium compounds. All of these compounds suffer from at least one of several major drawbacks: (1) they are replaceable items and must be replaced after consumption; (2) in situ generation of the compound creates a safety concern; (3) in situ generation is not yet technically feasible; (4) in situ generation is incompatible with CELSS equipment infrastructure. Additionally, many of these compounds have been linked to crew health problems after extended flight periods. Substitution of these conventional biocides with a safe, antimicrobial compound for which in situ generation is safe and possible is urgently needed for crew safety, maintaining process equipment, and solid waste sanitation. The aim of this project is to develop an on-demand electrochemical hydrogen peroxide generator that can be operated in microgravity from electrolysis of water with no consumable chemicals. Hydrogen peroxide also has the potential to be regenerative within the overall system as it breaks down into water and oxygen during the sanitizing process.

Primary U.S. Work Locations and Key Partners

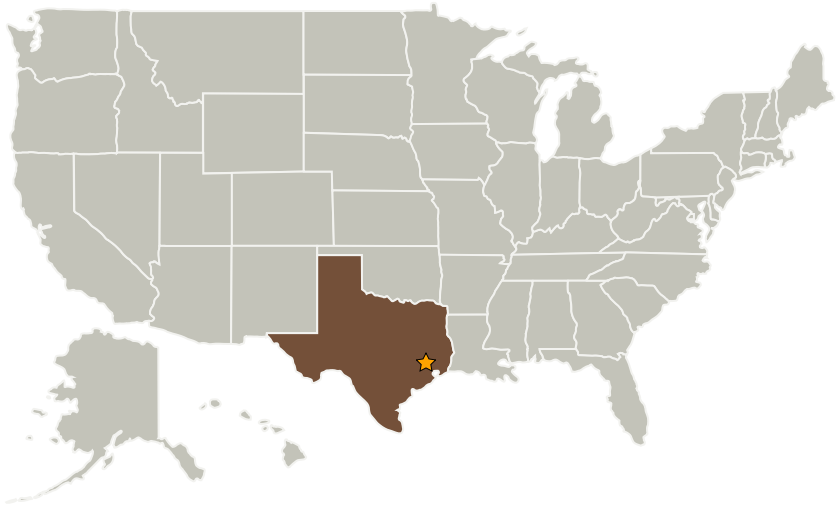

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Charles L Tennakoon

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.2 Water Recovery and Management